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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/625,671

07/24/2003

Ole Schlottmann

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20987 7590 03/20/2007  
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EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT

PAPER NUMBER

1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/20/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/625,671	<b>Applicant(s)</b> SCHLOTTMANN	
	<b>Examiner</b> Jeffrie R. Lund	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2, 4-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 6, 7, 9, 13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dornfest et al, US Patent 5,680,013, in view of Nguyen, US Patent 6,565,661 B1.

Dornfest et al teaches a showerhead that includes: a gas inlet 116 leading to a gas reservoir; a faceplate 120 or 150 fitted between the reservoir and a processing space including orifices 122, 154; and a sheet 115 directly attached to the faceplate, and having a plurality of orifices 117 and sealed to the faceplate between the faceplate and the reservoir. Or, alternately, a gas inlet 116 leading to a gas reservoir; a faceplate 115 fitted between the reservoir and a processing space including orifices 117; and an aluminum nitride sheet 120, 150 directly attached to the faceplate, and having a plurality of orifices 122, 154 and sealed to the faceplate between the faceplate and processing space. (Figures 14-16)

Dornfest et al differs from the present invention in that Dornfest et al does not teach that the orifice of the sheet is smaller than the orifice of the faceplate, or the size of the diameter of the orifice, or thickness of the sheet.

Nguyen teaches a showerhead that includes a large diameter orifice combined

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with a smaller diameter orifice to control the pressure drop across the showerhead. The smaller orifice has a diameter of 0.1 mm to 2 mm and a thickness of 0.5 mm to 5 mm.

(Entire document)

The motivation for making the size of the orifice in the sheet of Dornfest et al smaller than the orifice of the faceplate is to control the pressure drop between the reservoir and the processing space as taught by Nguyen.

The motivation for making the diameter of the orifice 0.15 mm, or thickness of the sheet less than 1 mm is to optimize the size of the orifice and thickness of the sheet of Dornfest et al as taught by Nguyen. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the orifice in the sheet of Dornfest et al smaller than the orifice of the faceplate and to optimize the size of the sheet as taught by Nguyen.

3. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dornfest et al and Nguyen as applied to claims 1, 4, 6, 7, 9, 13, and 15-20 above, and further in view of Arami et al, US Patent 5,938,850.

Dornfest et al and Nguyen differ from the present invention in that they do not

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teach a dividing plate or sheet with orifices and adjacent to the sheet that divides the reservoir into two reservoirs.

Arami et al teaches a showerhead 44 having two dividing plates or sheets 50 each having orifices 52 adjacent each other. (Figure 1)

The motivation for adding the dividing plate of Arami et al to the apparatus of Dornfest et al and Nguyen is to further diffuse the gas supplied to the showerhead and increase the gas distribution uniformity as taught by Arami et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a dividing plate of Arami et al to the apparatus of Dornfest et al and Nguyen.

4. Claims 1, 2, 4-9, and 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doppelhammer, US Patent 6,533,867 B2, in view of Nguyen, US Patent 6,565,661 B1.

Doppelhammer teaches a showerhead that includes: a gas inlet 25 leading to a gas reservoir 49a-c; a faceplate 46 fitted between the reservoir and a processing space including orifices; and a metal sheet 45 having a plurality of orifices attached to the face plate between the faceplate and reservoir via disk (sealing means) 42. Some of the orifices of the faceplate are aligned with the orifices of the sheet, and some are not. The faceplate 46 can also be a sheet. (Entire document)

Doppelhammer differs from the present invention in that Doppelhammer does not teach that the orifice of the sheet is smaller than the orifice of the faceplate, the material of construction of the sheet, or the size of the diameter of the orifice, or thickness of the

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sheet.

Nguyen teaches a showerhead that includes a large diameter orifice combined with a smaller diameter orifice to control the pressure drop across the showerhead. The smaller orifice has a diameter of 0.1 mm to 2 mm and a thickness of 0.5 mm to 5 mm.

(Entire document)

The selection of a material of construction is an obvious design choice, and one of ordinary skill in the art would be able to choose an appropriate material based on the processing and structural requirements. All of the claimed materials are commonly used in the showerhead art.

The motivation for making the size of the orifice in the sheet of Doppelhammer smaller than the orifice of the faceplate is to control the pressure drop between the reservoir and the processing space as taught by Nguyen.

The motivation for making the diameter of the orifice 0.15 mm, or thickness of the sheet less than 1 mm is to optimize the size of the orifice and thickness of the sheet of Doppelhammer as taught by Nguyen. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04)

The motivation for selecting a specific material of construction is to provide a

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material from which the showerhead can be made.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the orifice in the sheet of Doppelhammer smaller than the orifice of the faceplate, to optimize the size of the sheet as taught by Nguyen, and to select a specific material from which to make the apparatus of Doppelhammer.

5. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doppelhammer and Nguyen as applied to claims 1, 4, 5, 7-9, and 12-21 above, and further in view of Arami et al, US Patent 5,938,850.

Doppelhammer and Nguyen differ from the present invention in that they do not teach a dividing plate with orifices and adjacent to the sheet that divides the reservoir into two reservoirs.

Arami et al teaches a showerhead 44 having two dividing plates 50 each having orifices 52 adjacent each other. (Figure 1)

The motivation for adding the dividing plate of Arami et al to the apparatus of Doppelhammer and Nguyen is to further diffuse the gas supplied to the showerhead and increase the gas distribution uniformity as taught by Arami et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a dividing plate of Arami et al to the apparatus of Doppelhammer and Nguyen.

### ***Response to Arguments***

6. Applicant's arguments filed January 2, 2007 have been fully considered but they are not persuasive.

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In regard to the argument that if the skilled person were to consider combining the teaching of Nguyen with Dornfest or Doppleshammer then the result would be to form the front plate of Dornfest's or Doppleshammer's showerhead with orifices of varying diameter and not to insert a sheet with smaller diameters next to the faceplate, the Examiner disagrees. It has been held that making objects separable is obvious. (*In re Dulberg* 329 USPQ 148) Therefore, one skilled in the art would not necessarily make the showerhead with orifices of varying diameter as argued. One of ordinary skill in the art would also be motivated to simplify the manufacture of the multi-diameter showerhead. Nguyen teaches fundamental flow relationships that may be universally applied to any type of gas inlet having the taught shape. The showerheads of Nguyen are complex having multiple sized concentric holes that are expensive and difficult to manufacture. By changing the diameter of the orifices in the faceplate or the sheet of Dornfest et al or Doppleshammer, all the benefits of Nguyen can be implemented, without the extra cost and complexity of Nguyen. Thus, one of ordinary skill in the art would be motivated to make the suggested combination.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the



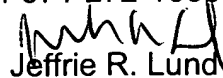
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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Jeffrie R. Lund  
Primary Examiner